

## Sustainability of Nigeria's Rail Transport System: An Economic Perspective

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### Abstract

The availability of an efficient transport system is germane in achieving trade promotion, social integration, business connectivity and economic development because transport plays relevant role in the growth of nation's market. Some scholars have given undeniable linkages to the role of rail transport in economic development while there are deferring summations by some scholars hence this study explored the economic sustainability of Nigeria's rail transport system to contribute to the body of knowledge debating the economic sustainability of rail transport globally. Previous researches have also been done in Nigeria and internationally on the subject area using different approaches but this research used concurrent triangulation design to validate the formulated hypothesis that rail transport system has not significantly affected local economic development. This was validated using simple linear regression and key informant interview (KII). The theoretical lens for the study is the Rostow's stages of economic growth. The result, [ $R^2 = .12$ ,  $F(1, 172) = 24.31$ ,  $p < .01$ ] showed that rail transport has contributed significantly to the local economic development and the KII generally reinforce the empirical findings hence hypothesis is rejected. This study recommended the permitting of more vendors providing services at the terminal as this will lead to vibrant local economic development whilst improving the standard of living of residents and the adoption of a holistic economic sustainability policy be embraced by the managers of rail transport system in the country.

**Keywords:** Railway, Transport, Sustainability, Economic Development,

### 1. Introduction

The availability and access to an efficient transportation facilities and services is considered essential to the economic and social existence of any nation. Muhammad et al. (2018) specified that the positive stimulation of economic activities through the improvement of spatial interaction will ensure the abundance of necessary resources which had hitherto been out of reach of citizenry due to spatial disparity. Some economists have given their attention to the connections between transport and economic sustainability and have specified the capacity of rail networks in reducing transportation cost and expanding industries, Qingyi (2018). Transport is regarded as the most dynamic activity in nearly all the developing countries of the world because of its impact on economic development, spatial expansion of cities, social interaction, industrial location and political integration, Rodriguez (2013). This position was earlier reiterated by Owen (1964) where he stated that 'transport creates mobility and immobility perpetuates poverty'. This stance must have been long envisaged by Lord Lugard where he asserted that the material development of Africa might be summed up in one word 'transport'.

Recently, various scholars have given empirical evidence of the undeniable linkage of transport to the environmental, economic and social development of nations, Apanisile and Akinlo (2013): Dannish and Baloch (2017): Oluigbo (2017): Qingyi (2018): Bansora (2019): Wang (2021) and Akbulaev and Bayramli (2022). At the economic level, a potent transport system plays a relevant role in the development of nation's market, assisting in transforming local markets into regional, national into international markets whilst

equally generating employment opportunities to the citizenry. The research by Mammadov (2002) on the role of transport in the development of the economy of Azerbaijan showed that improvement in transport could affect economic growth due to productivity increase, technological expansion and cost reduction. Ramirez (2001) studied the impact of rail transport on the Colombian's economic development using panel data set for the period 1914-1980. The study adopted fixed effect model and discovered that railroads did not play an overwhelming role in the Colombian economy, in contrast to other Latin American countries with similar rail transportation system such as Brazil and Mexico. This is however in contrast to the earlier work of Atack et al. (2010) that investigated whether railroad induced economic growth in the American Midwest for the period 1850-1860 using a newly developed GIS transportation database method. The outcome of that research revealed that the railroad was the reason for Midwestern urbanization, accounting for more than half of the increase in the fraction of population living in urban areas during the 1850s. Based on the aforementioned, which indicated deferring positions on the effect of rail transport on economic development, this study explored the Nigeria rail transportation economic sustainability using the concurrent triangulation method to validate whether rail transport system contribute to national economic wellness or not whilst contributing to the body of knowledge globally debating the economic sustainability of rail transport system.

## **2. Literature Review**

Sustainability, as described by Ewing and Cervero (2001), is the capacity to endure as well as survive, hence achieving sustainability will enable the earth continue to support human life. The three major pillars of sustainability are economic, social and environment. Dadang et al. (2020) stated that the condition for any sector to be sustainable is dependent on the rate at which it used renewable resources level does not surpass rates of regeneration. A sustainable transport is described as transportation where the beneficiaries pay their full social costs including those that should be paid for by future generation while Black (1996), defined it as transport that meets the current transport and mobility needs without compromising the ability of future generation to meet those needs. These definitions are based on the 1987 Brundtland report definition of sustainable development. In most cities of the world like in London, Berlin, Moscow, Shanghai and other developed cities, public transportation is mostly undertaken by rail transportation to ensure sustainability because railway has been found to be an efficient and environmentally sound means of intra and inter city transportation means that can move large number of people quickly and clean over short and long distances, Andrew (2020). Moreover, investments in transport infrastructures have positive impacts both for gross domestic product (GDP) and for job generation.

The positive contribution of rail transportation into job creation is green compared to other 'green' sectors like farming or waste management according to International Union of Railways UIC, (2015) as such over the years, many countries have successfully adopt it for their intra and intercity journeys. Oluwakoya and Ogundipe (2021) stated that rail transport offers a huge benefit to Nigeria socio-economic activity due to its large carrying capacity of both human and goods hence for Nigeria to be captured as a world developed economy as desired by her government, the revitalization of her erstwhile moribund rail transportation was required. Formerly in Nigeria, railway transportation suffered crisis and account for insignificant proportion of value added in the transportation sector, Chukwurah et al. (2022). The identified problems in the performance of Nigeria railway transport system included but not limited to poor management, negligence of the sector by the government and absence of a functional national transport policy, Adesanya (2010): Odeleye (2010): Ademiluyi and Dina (2011).

Howbeit, noticeable development in Nigeria public transport sector is a deliberate attempt by the government to revive railway transportation. This development has provided numerous benefits for the citizenry therefore realizing that railway plays major role in the decarbonizations of the economy with its

environmental, social and economic advantages led to the economic sustainability evaluation of the seemingly new double standard gauge rail since it has been expressed by Sahoo et al. (2022): Beyzathar et al. (2014): Dehghan and Safare (2018): Chung et al. (2019)” Akbulaev (2022) and Primmer (2022) that there is a long term equilibrium ratio between transport and economic development and adopting sustainable transportation practices such as investing in public transportation cum optimizing infrastructure will boost the attainment of long-term economic stability. Based on the foregoing, this study seek to empirically justify the recommendations made by team that investment in rail transport will improve the economic wellness of the nation.

There are various macroeconomic and socio-cultural indicators used by economists and geographers to assess the relative economic wellness of a given nation. Some of the indicators used include; GDP per capital, literacy and education, access to healthcare, social security and modern transportation. The first signs of development are usually observed in cities, and as cities are growing in terms of population size, their contributions to national GDP increases due to increased economic activities. European development economists have argued that the existence of modern transportation networks- notably high-speed rail infrastructure constitutes a significant indicator of a country’s economic advancement meanwhile, the transport system in Nigeria before now cannot be described as modern hence the country not classified as being economically advanced however given the adoption of railway, it become imperative to appraise her economic viability.

Evidently, Dehghan and Safere (2018) analyzed the effect of road and rail transportation infrastructure on economic growth of Iranian province over ten (10) years and discovered that the total length of railway has positive impact on the economic growth of the area while Chung et al. (2019) also reviewed the impact of high speed rail on the economy of the region and their findings revealed that economic growth can be attained from high speed rail development. Earlier, Apanishile and Akinlo (2013), appraised the contribution of rail transport to economic growth in Nigeria using time series data for a period of twenty-one (21) years of 1970-2011 and discovered that rail transport enhances economic growth. Equally, the availability of a functioning transport system has been summated to be crucial to the economic and social existence of any nation as found in the works of Adesanya (2010): Oluigbo (2014): Polykora and Bansora (2019): Wu et al. (2021): Primmer (2021): Abkulaev and Bayramil (2022) and so many have cited that an efficient transportation service is capable of influencing sustainable economic development. Therefore, consistent with developments in the literatures reviewed on rail transport system and economic development cum the various approaches to the studies gave an impetus to use a mixed methodological approach to explore the economic sustainability of rail transportation in Nigeria with special attention to the newly constructed Lagos-Ibadan rail corridor.

A relevant theory found useful in justifying this study is the Rostow’s stages of economic growth theory. The theory stated that five steps which all countries must pass to become developed are traditional society, preconditions to take-off , take-off, drive to maturity and age of high mass consumption. The theory specified that transport plays a key role in each of the postulated economic development stages. An assumption of the theory is that all countries, whether developed or developing all have equal chance to develop without regards to population size or natural resources. Rostow’s stages of economic growth however opined that efficient transportation system is required in the industrial revolution drive and therefore calls for increased investment in transportation. Given the noticeable huge investment in rail transportation in the country Nigeria and the backdrop of Rostow’s stages of economic growth, the contribution of the rail transport system operation to the development of local economy at the terminal communities (where key rail assets were located) was explored.

### **3. Material and method**

### 3.1. Study area:

The study involved an economic sustainability exploration of rail transport system on the economic development of terminal host communities using the Lagos-Ibadan rail corridor. The construction of the rail corridor commenced in 2017 and was completed in 2021 after Ajaokuta- Warri rail corridor in 2020 by Muhammadu Buhari's led administration in Nigeria. The train on Lagos-Ibadan rail corridor commenced commercial activities on the 10th day of June 2021 on a double standard gauge railway with twenty-four (24) coaches with track spanning across three Nigerian south-western states namely, Lagos, Ogun and Oyo states.

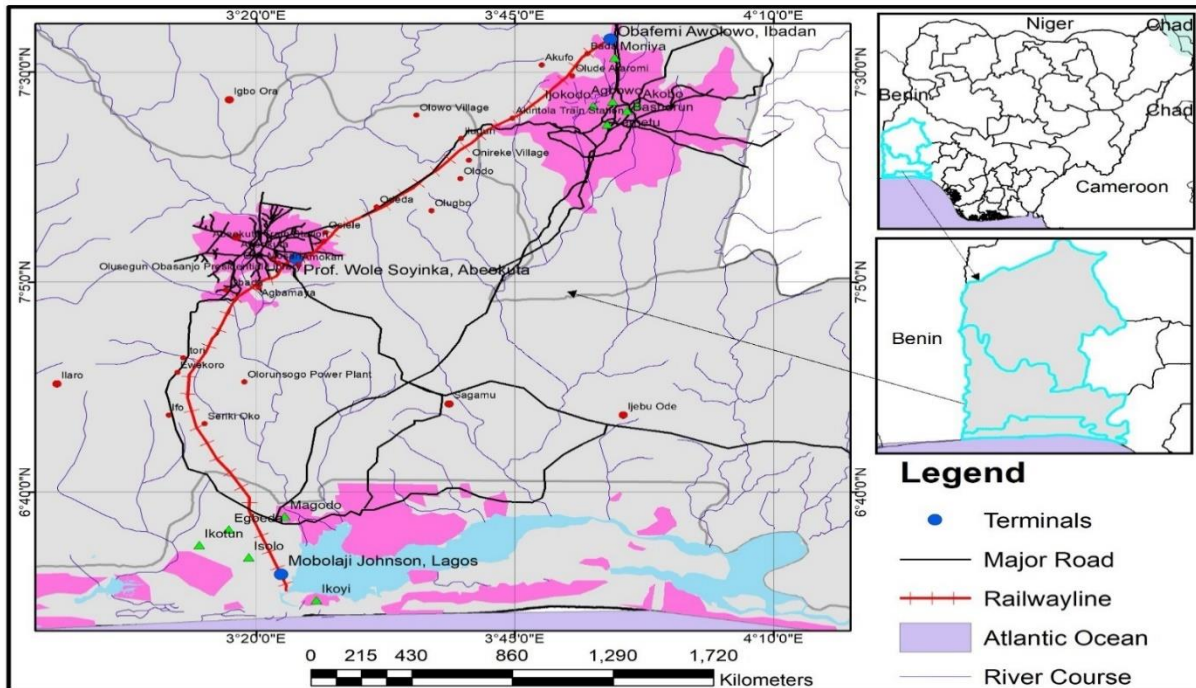


Figure 3.1 Rail Tracks Indicating Major Selected Terminals on the Lagos- Ibadan Modern Rail Corridor  
Source: Cooperative Information Network (COPINE) (2023)

### 3.2. Methodology:

The methodological approach for the study employed mixed methods using concurrent triangulation design. Data for the study were sourced through primary and secondary sources. The primary data involved the administering of predetermined set of questionnaires, direct observations and conduct of key informant interview (KII) to obtain information on perceived rail transport system operation and local economic development. Secondary information were sourced from textbooks, journals and articles. The sampling technique was multistage involving stratified techniques to delineate the rail terminals along the corridor into states. Systematic sampling techniques used to identify terminal communities from which respondents were selected from, based on the level of activities currently on-going at the terminals and convenience sampling technique was used in administering the questionnaire to the vendors at the terminals and residents of the host communities. The conduct of key informant interviews were directed to the community heads of each selected town along the rail corridor.

Table 3.1. Description of the Sample Size

S/N	Terminal/Community	Number of Participants	Percentage %
1	Mobolaji Johnson terminal, Yaba	310	36
2	Obafemi Awolowo terminal, Moniya	485	56
3	Prof Wole Soyinka terminal, Abeokuta	75	8
	<b>Total</b>	<b>870</b>	<b>100</b>



### 3.3. Data Analysis

Data collected were analyzed using descriptive and inferential statistical techniques. Finding were analyzed following the review of key informant interview sessions held with the community leader and empirically using simple linear regression. This necessitated the formulation of hypothesis: **H<sub>0</sub>**: Rail transport system operation has not significantly affected the local economics at the study area.

**H<sub>1</sub>**: Rail transport system operation has significantly affected the local economics at the study area.

## 4. Result and Discussion

**Table 4.1. Simple Linear Regression Analysis Showing the Influence of Rail Transport System Operation on Local Economic Development**

Predictors	B	T	P	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Df	F
Operation of Modern Rail	.35	4.93**	< .01	.35	.12	.12	1, 172	24.31**

\*\* p < 0.01 , N= 870

Source: Researcher’s Field Survey, 2023.

The result showed that operation of rail transport system had significant influence on the local economies in the study area ( $\beta=.35$ ,  $t= 4.93$ ,  $p < .01$ ). It was indicated that 12% variance in economic activities could be attributed to the rail transport system operation as discovered that [ $R^2= .12$ ,  $F(1, 172) = 24.31$ ,  $p < .01$ ]. The outcome of the KII, held to validate or invalidate the results is thus presented. One of the interviewee, a community heads and male, sixty-five (65) years old at the study area revealed that the construction of the rail terminal within the community has resulted in economic wellness by providing them with seamless and efficient means of transportation and wider visibility. When asked whether the rail operation has a positive effect on the community, an excerpt of the response is presented below:

*‘The rail has opened up this community. It has not only given us the chance to better connect with neighboring communities but we can easily exchange our produce, just that the train is not doing short trip. People that don’t know our town before now do because of the railway’*

The rail operation is said to expand the visibility of studied locations and the display of local wares to larger crowd. It was summated by another community head that the Lagos-Ibadan modern rail have equally facilitated increase business activity and created more jobs hence leading to witnessed economic growth within the community. It was said and I accordingly report that,

*‘The presence of rail terminal made us to foreigner during its construction, I mean the foreigners working at the terminal. These people relate well with our children working at the terminal and may help us to establish company (social amenities which the government alone cannot provide) in our community. This will hence result in more opportunities for this locality.*

The response from the third community head is in tandem with previously interviewed community heads and this conforms to findings from literature. He reiterated that,

*‘Some residents of this community became employed due to this rail operation. Some of our natives became motorcyclists and cab operators at the terminal. Some women that didn’t have any form of employment were lucky during COVID-19 as they sold nose cover to rail passengers. Other even sold hand sanitizers’.*

## 5. Conclusion

A community with a well-connected rail network can attract more visitors, leading to increased spending on accommodations, local attractions, restaurants, and other sort of transit associated business that will cater for the visitors. This will in turn, creates more revenue for the community. It was discovered after the study that economic activities at the study area increases with significant progress in the operation of modern rail transport and the KII generally reinforce the empirical findings hence the formulated hypothesis which states that railway transport system has not significantly affected the local economic development at the study area is rejected. The modern rail transport operation has resulted in visible 12% positive economic growth of the local communities therefore it is concluded that railway transportation has significantly affected the local economics at the study area. Based on the result of the findings, it is recommended that the management of Nigeria Railway Corporation should consider permitting more retailers so as to increase the number of vendors providing services such as food selling, retail shops, car hires and other services at the terminal. Economic policy permitting community member inclusiveness should be formulated and adopted by rail transport manager in the country as this will help to create a more vibrant economic terminals environment whilst improving the standard of living of residents involved.

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